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Oral health-related quality of life among preschool-aged children

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ABSTRACT

Research on oral health–related quality of life among preschool children in Vietnam is still scarce; therefore, this study investigated the OHRQoL of three-year-old children and explored related factors. A cross-sectional survey was carried out between April and June 2021 in kindergartens in a city of a northern Vietnamese province, involving 430 preschool children and their parents, with OHRQoL measured using the PedsQL™ Oral Health Scale and associated factors analyzed using multivariable Tobit regression. The average Oral PedsQOL score was 77.1, reflecting a moderate level of OHRQoL. Better OHRQoL was observed among children whose parents had higher educational attainment and those who consumed milk daily, whereas poorer OHRQoL was associated with a greater number of dental caries, frequent gum bleeding, preference for eggs and sweet foods, and brushing teeth twice daily. Overall, the findings indicate that oral health–related quality of life in preschool children is influenced by parental education, oral health conditions, and daily oral care and dietary practices.

KEYWORDS: Oral Health–Related Quality Of Life; Preschool Children; Oral Health.

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INTRODUCTION

Oral diseases such as dental caries, gingivitis, malocclusion, and dental trauma can affect daily life by causing pain, discomfort, and functional limitations, thereby influencing social interaction, emotional well-being, and physical health. Oral health is therefore an essential component of overall health [1–3]. In children and adolescents, good oral health is particularly important, as oral problems may interfere with learning ability, physical growth, social participation, and everyday activities, leading to a reduced quality of life [4,5].

Oral Health–Related Quality of Life (OHRQoL) is defined as a multidimensional concept that reflects an individual's subjective perception of oral health, functional status, emotional well-being, satisfaction with care, and self-image [6]. Assessing OHRQoL helps to identify the perceived needs of children and their families and provides useful evidence for planning oral health programs. This approach supports the identification of high-risk groups and contributes to improving access to appropriate oral healthcare services [7,8].

Dental caries and dental injuries in childhood have been shown to negatively affect the OHRQoL of both children and their parents [9–11]. Untreated caries may impair growth, nutrition, cognitive development, and overall quality of life, and in severe cases may require hospitalization or emergency dental treatment [12]. Early childhood caries is a common condition worldwide and is associated with poorer OHRQoL in affected children compared with those who receive adequate care [13]. In Vietnam, despite the implementation of preventive programs, childhood caries remains highly prevalent, particularly in rural areas with limited access to dental services. Evidence on OHRQoL among preschool children in Vietnam is still limited [14]. Therefore, this study aimed to describe the OHRQoL of three-year-old preschool children and to analyze factors related to OHRQoL in a northern province of Vietnam.

METHODS

A descriptive cross-sectional survey was carried out between April and June 2021 in four kindergartens situated in an urban area of a northern Vietnamese province. The target population consisted of three-year-old preschool children and their parents. Children were excluded if they did not reside with their parents, if parental consent was not provided, if they had entered the permanent dentition stage, or if they had special health care needs. Participant selection followed a multi-stage sampling approach. Initially, three communes were randomly drawn from the list of communes in the city. Subsequently, one kindergarten was randomly selected within each chosen commune. With the assistance of school teachers, all eligible children and their parents in these kindergartens were invited to join the study. A total of 430 child–parent pairs participated.

Dental examinations were performed to assess dental caries and restored teeth following World Health Organization criteria. Primary missing teeth were not included because it was not possible to determine whether tooth loss was due to caries or natural exfoliation. The examinations were conducted by two trained and calibrated dentists using a head flashlight, dental mirror, and explorer. Intra- and inter-examiner agreement for dental caries and dental plaque assessment exceeded 85%. Parents

completed a self-administered questionnaire after receiving standardized instructions from one investigator. The questionnaire collected information on parental sociodemographic characteristics, children's general and oral health status, dietary habits, oral hygiene practices, and dental service use. Oral health-related quality of life was assessed using the PedsQL™ Oral Health Scale, which includes five items rated on a five-point scale. Item scores were reversed and transformed to a 0–100 scale, with higher scores indicating better OHRQoL. The toddler version was completed by parents or guardians [15]. The Cronbach's alpha of the scale was 0.8365.

The data were first summarized using descriptive statistical methods. Differences in OHRQoL across sociodemographic characteristics and oral health conditions were examined using the Mann–Whitney and Kruskal–Wallis tests. Factors related to children's OHRQoL were then explored through multivariable Tobit regression analysis, and the findings were reported with adjusted estimates and 95% confidence intervals. All analyses were performed using Stata version 16.0, with a significance level of $P < 0.05$.

Ethical approval was obtained from the Ethical Committee of Hanoi University of Public Health (229/2020/YTCC-HD3). Written informed consent was obtained from all parents before participation.

RESULTS

A total of 430 preschool children and their parents participated in the study. Boys accounted for a larger proportion of the sample, and most children lived in rural areas. Parental education was generally low, with fewer than half having education above high school. Dental caries was highly prevalent among children, with an average of 4.7 carious teeth, and bleeding gums were commonly reported. Regarding diet, meat, eggs, milk, and sweet foods were frequently reported as children's favorite foods. Most children consumed sweet foods and sweet drinks occasionally, including before bedtime. Toothbrushing habits were relatively positive, as more than half of the children brushed their teeth twice a day; however, over one-third of children had never visited a dental clinic since birth. (Table 1)

Table 1. Key characteristics of children and parents (n = 430)

Characteristics	n (%) / Mean ± SD
Child characteristics	
Male	254 (59.1)
Rural residence	162 (37.7)
Dental caries (yes)	330 (76.7)
Mean number of caries	4.7 ± 4.7
Malnutrition (yes)	49 (11.4)
Bleeding gums (any frequency)	181 (42.2)
Previous dental caries experience (yes)	220 (51.1)
Parental characteristics	
Education > high school	198 (46.1)
Father's age (years)	34.2 ± 5.0
Mother's age (years)	34.6 ± 4.9
Child behaviors	
Eats sweet food sometimes or often	374 (87.0)
Uses sweet drinks sometimes or often	328 (76.3)
Uses sweet food/drink before bedtime (sometimes or often)	297 (69.1)
Brushes teeth twice/day or more	288 (66.9)
Never visited a dental clinic	158 (36.7)
Daily milk consumption	320 (74.4)

The mean Oral Health–Related Quality of Life score reported by parents was 77.1, indicating a moderate to good level of OHRQoL. Tooth pain and pain related to eating hot, cold, or sweet foods were mostly reported as never or almost never

occurring, although a considerable proportion of children sometimes experienced these problems. Changes in tooth color and bleeding during toothbrushing were also reported, but frequent or persistent problems were uncommon. (Figure 1)

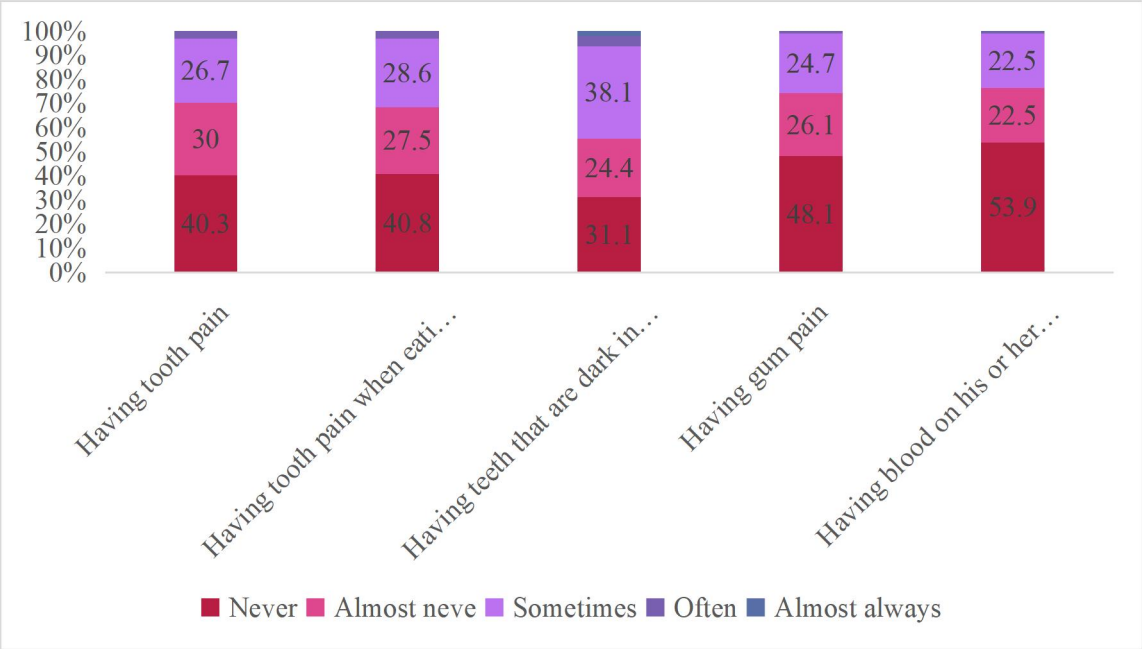

Figure 1. Parent-reported oral health problems among preschool children

Multivariate analysis showed that higher paternal education and daily milk consumption were positively associated with OHRQoL. In contrast, a greater number of carious teeth, frequent bleeding gums, preference for eggs and sweet foods, frequent consumption of sweet drinks, and eating sweet foods or drinks before bedtime were associated with lower OHRQoL. Toothbrushing twice a day was also associated with lower OHRQoL compared with brushing once a day or less. (Table 2)

Table 2. Factors significantly associated with oral health–related quality of life among preschoolers

Factors	Coef.	95% CI	p-value
Father's education > high school	7.53	3.00 to 12.06	<0.01
Number of caries (per tooth)	-0.73	-1.23 to -0.23	<0.01
Bleeding gums (ever vs. never)	-15.86	-20.92 to -10.80	<0.01
Previous dental caries experience (yes)	-12.31	-16.10 to -8.52	<0.01
Sweet food/drink before bedtime (often)	-18.27	-27.57 to -8.97	<0.01
Sweet drink use (sometimes)	-8.64	-16.91 to -0.36	0.04
Egg as favorite food	-5.76	-10.14 to -1.38	0.01

Sweet food as favorite food	-4.94	-9.05 to -0.83	0.02
Daily milk consumption	6.54	1.91 to 11.16	0.01
Brushing teeth twice/day	-4.40	-8.46 to -0.34	0.03

DISCUSSION

This study helps to clarify how oral health conditions and daily behaviors affect the quality of life of preschool children, as perceived by their parents. Using the PedsQL™ Oral Health Scale, we found that children with oral health problems had lower oral health–related quality of life scores than those without such problems [16]. This finding is consistent with previous studies showing that dental caries, gum bleeding, tooth position problems, and other oral conditions are associated with poorer OHRQoL in children [17–19]. Evidence from earlier reviews also confirms that oral diseases such as dental caries and malocclusion negatively influence children's overall well-being and daily functioning.

Parents were used as proxy respondents in this study, which is common in research involving preschool children [20]. However, parents' understanding of their children's oral health may be influenced by their educational level. Our results showed that higher parental education was associated with better OHRQoL in children, which is in line with some previous studies [20] but differs from others [21]. This finding suggests that oral health education programs should focus more on parents with lower educational backgrounds. Improving parental knowledge may help reduce risk factors such as high sugar intake, poor oral hygiene, and unfavorable socioeconomic conditions, which are known to negatively affect children's quality of life.

Dietary habits were also related to OHRQoL in this study. Frequent consumption of sweet foods and drinks was associated with lower OHRQoL, while daily milk consumption was linked to higher OHRQoL. These associations are likely mediated by dental caries, as high sugar intake increases the risk of tooth decay, leading to pain and discomfort. In contrast, milk consumption may contribute to better tooth strength and oral health, thereby improving children's quality of life. These findings highlight the importance of promoting healthy eating habits from an early age.

This study has some limitations. Due to its cross-sectional design, causal relationships between OHRQoL and related factors cannot be established. In addition, the study was conducted in a limited community setting, which may not fully represent all preschool children in Vietnam. Oral health conditions and quality of life may vary across regions and socioeconomic contexts. Therefore, future longitudinal studies conducted in multiple regions are needed to provide a more comprehensive understanding. Based on these findings, we recommend that preschools implement regular oral health education programs for parents to improve oral care practices for young children. Further research should also include older children and be conducted in different localities to better understand factors affecting oral health across childhood.

CONCLUSION

Preschool children in this study had a moderate level of oral health–related quality of life. Girls had significantly higher OHRQoL scores than boys. Higher parental education was associated with better OHRQoL in children. Frequent toothbrushing twice a day was associated with lower OHRQoL compared with brushing once a day or less. These findings emphasize the importance of parental education, healthy dietary habits, and appropriate oral health practices in improving the quality of life of preschool children.

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